

DESIGN STANDARDS

The design and implementation of the projects contained in the preferred alternative will be performed in accordance with industry standards, regulatory requirements and local government standards. This section presents the accepted industry resources and which elements apply to the proposed projects.

American Water Works Association (AWWA)

The following are AWWA standards that will be applicable to the facilities in the proposed projects:

- A97-100 - Groundwater and Wells
- C104, C105, C110, C111, C115, C116, C150, C151, and C153 - Ductile Iron Pipe and Fittings
- C200, C203, C205, C206, C207, C208 - Steel Pipe
- C500, C501, C504, C540 - Valves and Hydrants
- C600s - Disinfection Facilities
- C900s - Plastic Pipe
- C901, C906 - HDPE Pipes

Florida Department Of Environmental Protection (FDEP)

The following are the FDEP regulations (Florida Administrative Code) applicable to the facilities under consideration:

- 62-40 - Water Policy
- 62-520 - Ground Water Classes, Standards, and Exemptions
- 62-521 - Wellhead Protection
- 62-522 - Ground Water permitting and Monitoring Requirements
- 62-524 - New Potable Water Well Permitting in Delineated Areas
- 62-528 - Underground Injection Control
- 62-531 - Water Well Contractors
- 62-532 - Water Well Permitting and Construction Requirements
- 62-550 - Drinking Water Standards, Monitoring, and Reporting
- 62-600 - Domestic Wastewater Facilities (Reuse requirements)
- 62-610 – Reuse of Reclaimed Water and Land Application
- 62-650 - Water Quality Based Effluent Limitations
- 62-520 - Ground Water Classes, Standards, and Exemptions

Class I reliability, as defined by the US EPA and stated in FDEP's regulations refers to reliability of mechanical, electrical, and fluid systems. For major equipment items (pumps, blowers, etc.), the capacity and operations should be designed for the maximum design flows with the largest unit out of service.

United States Environmental Protection Agency (US EPA)

The Class V - Underground Injection Control Study, Volume 21-Aquifer Recharge and Aquifer Storage and Recovery Well, September 1999. This document presents best management practices for aquifer storage and recovery (ASR) wells.

Ten States Standards / Recommended Standards for Water Works Great Lakes-Upper Mississippi River Board (2003 Edition)

These standards include design guidelines for :

- Treatment – Part 4
- Pumping Facilities – Part 6
- Finished Water Storage – Part 7
- Distribution System Piping and Appurtenances – Part 8

ASR WELL STANDARDS

Criteria and standards for Class V wells are addressed in Chapter 62-528 FAC. ASR systems are categorized Class V Group 7. For these wells, there are standards of design and construction required for any construction permit application. In order to operate the well, it must be demonstrated that the well operation will not adversely affect underground sources of drinking water (USDW). Approval to operate the system by the FDEP will be subject to operating and reporting requirements, such as meeting drinking water standards for the injectate.

Surface water sources are a major part of the RIDS program. Therefore, ASR wells receiving surface water are a Under Direct Influence (UDI) of surface water, which will require more extensive sampling and monitoring requirements. This needs to be considered from a cost and operations standpoint.

Siting and Construction Requirements

Specific construction standards for Class V wells have not been enacted by Florida because of the variety of Class V wells and their uses. Instead, the state requires the well to be designed and constructed for its intended use, in accordance with good engineering practices, and approves the design and construction through a permit. The state can apply any of the criteria for Class I wells to the permitting of Class V wells, if it determines that without such criteria the Class V well may cause or allow fluids to migrate into a USDW and cause a violation of the state's primary or secondary drinking water standards, which are contained in Chapter 62-550 of the FAC. However, if the injectate meets the primary and secondary drinking water quality standards and the minimum criteria contained in Rule 62-520-400 of the FAC, Class I injection well permitting standards will not be required.

Class V wells are required to be constructed so that their intended use does not violate the water quality standards in Chapter 62-520 FAC at the point of discharge, provided that the drinking water standards of 40 CFR Part 42 (1994) are met at the point of discharge.

Water Quality

The following are federal rules and programs that regulate ASR well water quality:

- Total Trihalomethane Rule (TTHMs)
- Surface Water Treatment Rule
- Total Coliform Rule
- Interim Enhanced Surface Water Treatment
- Stage 1 Disinfection Byproducts Rule
- Radon Rule
- Ground Water Rule

Siting and Construction

In order to determine the location and spacing of the ASR wells, the following should be considered:

- Proposed storage zone background water quality, permeability, and confinement characteristics
- Background hydrogeology
- Projected withdrawal rates
- For surface water ASR system, discharge locations
- Nearby users of potential storage zones

Florida has enacted specific regulation requirements for Class V wells that include:

- Calibration of pressure gauges and flow meters every six months
- Monitoring of the storage zone and the next overlying permeate zone
- Monthly and annual reports of injected and recovered water qualities and quantities

Water injected into the ASR wells must meet water quality requirements such as the following:

- Primary and Secondary Drinking Water Quality Standards (Chapter 62-550 FAC)
- Minimum criteria in Rule 62-520-400 of FAC- Ground Water Classes, Standards, and Exemptions/ Minimum Criteria for Ground Water

Operation requirements

Class V wells are required to operate in a manner that does not present a hazard to an USDW and to meet the water quality standards presented in Rule 62-520 FAC. The following operating and maintenance practices are recommended for successful operations of ASR wells:

- Periodic change in operating mode
- Periodic back-flushing to waste during recharge

Monitoring

Only wells with injectate being treated by a permitted drinking water facility in accordance with rules 62-528.615(1)(a)2 FAC do not require monitoring. None of the well injectate in the proposed projects in this Sub-Region is expected to originate from a drinking water treatment facility; thus, monitoring requirements will be included in the Class V use permit.